

Year 12 Physics - Math review

SOLUTIONS

Sheet 1: The basics – No calculator allowed!

1) Adding and subtracting with negative numbers

a) $-2 + -3 = -5$

b) $-4 + 2 = -2$

c) $8 - -5 = 13$

d) $-6 - 3 = -9$

e) $-4 - -7 = 3$

f) $3 + +5 = 8$

g) $7 + -3 = 4$

h) $9 - +2 = 7$

2) Multiplying and dividing with negative numbers

a) $-3 \times -6 = 18$

b) $-a \times -b = ab$

c) $-18 \div -9 = 2$

d) $-a \div -b = a/b$

e) $+3 \times -2 = -6$

f) $24 \div -8 = -3$

g) $24 \times -2 = -48$

h) $+a \div -b = -a/b$

3) Order of operations

a) $(5 - 3)^2 - 2 \times 4 = -4$

b) $20 - [2 \times (3 + 5)] = 4$

c) $6(4 + 5 \times 9) = 294$

d) $-3 \times (2 + -4) = 6$

4) Multiplying and dividing variables

a) $8x \times 4 = 32x$

b) $3x \times 2y = 6xy$

c) $6a \times 2a \times 2b = 24a^2b$

d) $2a^3b^5 \times 3a^2b^4 = 6a^5b^9$

e) $\frac{20x}{4} = 5x$

f) $\frac{56}{7x} = 8/x$

g) $\frac{9x^5}{3x^3} = 3x^2$

h) $\frac{3a^7}{4a^2} = 3a^5/4$

5) Multiplying and dividing exponents – you don't need to evaluate (a) and (b), just simplify

a) $2^3 \times 2^4 = 2^7 (=128)$

b) $3^4 \times 3^{-2} \times 4^5 = 3^2 4^5$

c) $y^5 \times y^{-2} \times y^3 = y^6$

d) $c^2 \times 4^5 \times c^{-6} \times 7^3 = 4^5 \times 7^3 / c^4$

e) $\frac{2^8}{2^6} = 2^2$

f) $\frac{x^9}{x^4} = x^5$

g) $\frac{y^7}{y^{-3}} = y^{10}$

h) $\frac{x^{-9}}{x^4} = x^{-13}$

6) Negative exponents – rewrite these in an alternative form

a) $\frac{1}{x^7} = x^{-7}$

b) $\frac{1}{u^{-3}} = u^3$

c) $2^{-4} = 1/2^4$

d) $x^{-2} = 1/x^2$

